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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/042,681	03/12/98	ISHIDA	A MAT-5870

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IM62/0414

EXAMINER

CREPEAU, J

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 04/14/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/042,681

Applicant(s)  
Ishida et al

Examiner  
Jonathan Crepeau

Group Art Unit  
1745



☒ Responsive to communication(s) filed on Apr 6, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1, 2, 5, 7, 8, 10, 12, 13, and 15 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1, 2, 5, 7, 8, 10, 12, 13, and 15 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Response to Amendment*

1. This Office action addresses claims 1, 2, 5, 7, 8, 10, 12, 13, and 15, after entry of the amendment filed on April 6, 2000. The claims are rejected under 35 USC 103 over the art of record; however the grounds of rejection have been changed. Therefore, **finality is withdrawn** and prosecution is reopened.

### *Claim Rejections - 35 USC § 103*

2. Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peled et al (WO 94/24715). Peled et al teach a lithium polymer secondary battery comprising a positive electrode (made of lithium transition metal compound oxide), negative electrode and polymer electrolyte on page 6, first paragraph. A ceramic (alumina) not relating to charge and discharge is contained in the electrolyte, which is contained in the anode (see Example 22). The ceramic is granular with a particle size of 0.05-0.5 microns, and is contained in the electrolyte in a quantity of 1-20 volume %. (see page 4, first full paragraph). In Example 22, Peled et al disclose a 6% volume fraction of alumina in the electrolyte, resulting in a the weight percentage of alumina in the alumina/anode active material (coke) mixture of 17.4% (according to the examiner's calculations using densities obtained from the *Prokon* software package of 3.965 and 2.1 g/cc for alumina and coke (amorphous carbon), respectively).

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In Example 22, Peled et al do not explicitly teach in a weight percentage of ceramic to (ceramic + active material) under 9.09% (according to the maximum percentage of instant claims 1, 12, and 13 obtained by dividing 10 by (100+10)).

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would realize that the alumina volume percentage in Example 22 could be 1%, based on the broader disclosure of volume percentage on page 4. Carrying out the same calculations as above, this results in an alumina weight percentage of 3.4%, thereby overlapping with Applicant's claimed range. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists (*In re Wertheim*, 191USPQ 90; *In re Woodruff*, 16 USPQ2d 1934).

3. Claims 1, 2, 5, 7, 8, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peled et al, in view of Kawakami (U.S. Pat. 5,888,666), or Blonsky (U.S. Pat. 5,648,011).

Peled et al is applied for the reasons stated in the rejection above. In addition, the ceramic (alumina, silica or magnesia) is incorporated in the electrolyte and cathode, as taught on page 4, first and second full paragraphs, and page 6, last sentence of first paragraph (the polymer electrolyte may also be incorporated in the composite cathode). The main component of the composite electrolyte is polyethylene oxide (PEO), as taught on page 5. An organic electrolyte solution dissolving lithium salt is taught on pages 4 and 5.

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Peled et al do not explicitly teach that the polymer electrolyte is a gel, or the weight fraction of nonaqueous electrolytic solution.

Kawakami teaches a polymer gel which may comprise PEO in the paragraph starting in column 8, line 43.

Blonsky teaches a gelled electrolyte including a gelling agent made of alumina in the abstract.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because either of these references show that the polymer electrolyte of Peled et al could be termed a "gel". Kawakami teaches a number of polymers that are inherently gelled materials, including PEO. Therefore, the artisan may surmise that while Peled et al call their electrolyte a "composite solid electrolyte," the polymer component of the electrolyte is really a gel. Additionally, Blonsky teaches that silica, alumina, and magnesia are all used as gelling agents in an electrolyte. Therefore, the artisan may surmise that because alumina (a gelling agent) is used in the polymer electrolyte of Peled et al, the electrolyte must then be a gel.

Furthermore, the weight fraction of electrolytic solution has not been shown to be a critical variable in the practice of the invention. Thus, the prior art is sufficient to render *prima facie* obvious the claimed range of parts by weight. Applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range (*In re Woodruff*, 16 USPQ2d 1934).

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*Response to Arguments*

Applicant's arguments filed April 6, 2000 have been fully considered but they are not persuasive. Applicants state that Peled et al is directed to a "composite solid electrolyte which does not include electrolytic solution but rather includes polymer electrolyte", but the Examiner maintains that this is not the case. On page 5, the reference explicitly teaches that "the solid CSEs preferably contain an electrolyte such as [.....] an aprotic organic solvent". Thus, Applicant's assertions that the CSEs of Peled et al do not contain a liquid electrolytic solution are not convincing. Additionally, for the reasons set forth above, the Examiner maintains the "solid" electrolyte of Peled et al is actually a "gel".

*Conclusion*

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Maria Nuzzolillo, can be reached at (703) 305-3776 from Monday-Thursday. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

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Documents may be faxed to (703) 306-3429. The official fax number for documents of extreme importance is (703) 305-3599 (it will take longer to receive documents faxed to this number; therefore the first number is preferred).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

April 12, 2000

Maria Nuzzolillo  
Supervisory Patent Examiner  
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